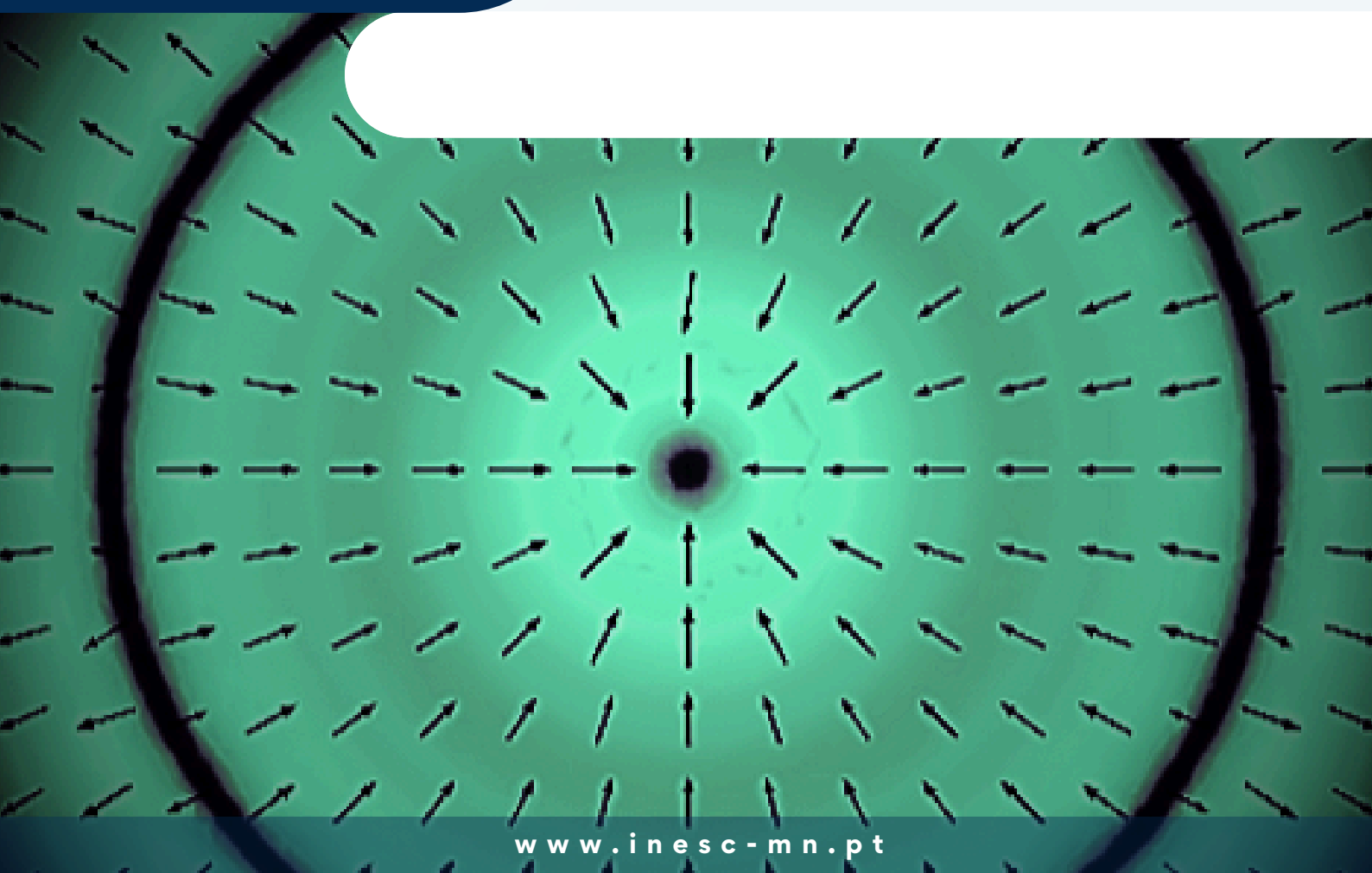


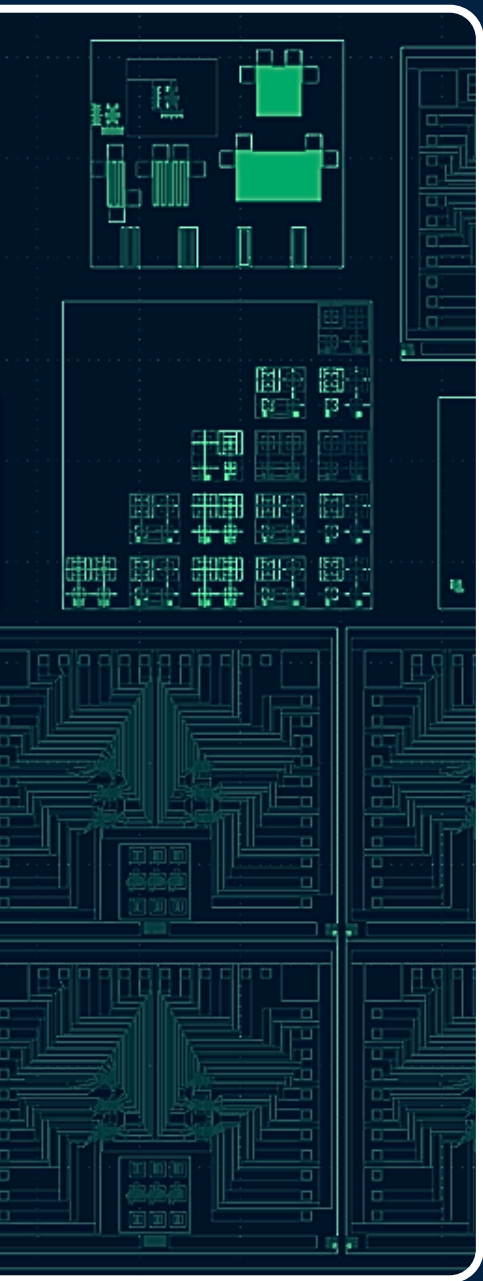
DIGITAL INFRASTRUCTURE

Tools for simulation, design, and analysis across engineering and scientific fields to support innovation and precision in various applications.





LET'S WORK TOGETHER

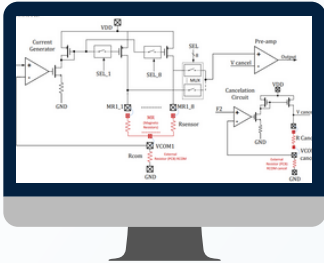


At INESC MN, we harness a diverse suite of software tools to drive research, development, and innovation across multiple scientific and engineering fields.

From multiphysics simulations and integrated circuit design to micromagnetic modeling and technical drawing, these tools enable precise analysis, optimization, and validation of complex systems.

By integrating advanced computational environments with cutting-edge modeling and verification techniques, we enhance the design process, accelerate prototyping, and facilitate breakthrough discoveries.

In addition, we develop custom C++ and Python programs tailored to specific research needs. These in-house tools ensure flexibility and adaptability in tackling scientific challenges.



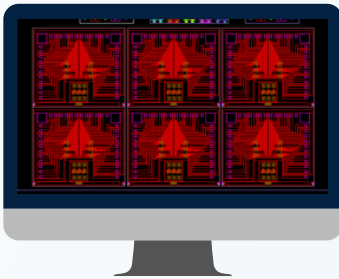
IC DESIGN SIMULATION

CADENCE | SYNOPSYS | SIEMENS

Integrated circuits software environments, including more specialized modules for digital (Xcelium, Genus and Innovus) and electromagnetic simulation (EMX), design and validation (Assura, Quantus, Calibre).

TECHNICAL DRAWING

AUTODESK AUTOCAD & FUSION



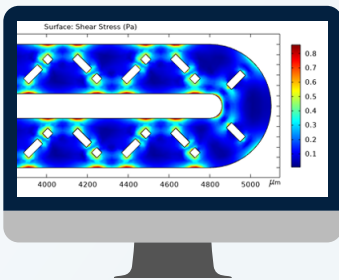
CAD software for creating precise 2D and 3D drawings and modelling, integrated with CAM and CAE features. Commonly used for masks design in lithography processes, design of microfluidic modules, mechanical parts, among others.

KLAYOUT

Layout editor and multiplayer viewer, widely used in semiconductor mask design and fabrication.

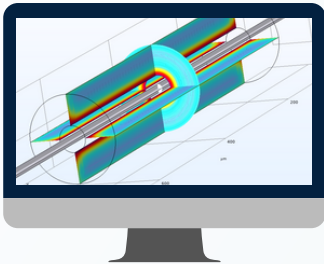
MULTIPHYSICS SIMULATION

COMSOL MULTIPHYSICS V5.1



Finite element analysis and simulation software for modeling complex physical phenomena, coupled with partial differential equations (PDEs) for detailed modeling of heat transfer, fluid dynamics, structural mechanics, and electromagnetic fields.

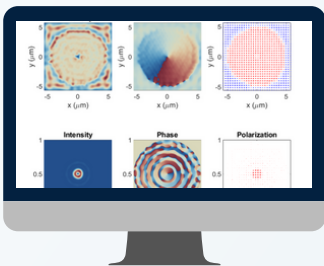
MULTIPHYSICS SIMULATION



COMSOL MULTIPHYSICS V6.4 (MODULE AC/DC)

Module for static and low-frequency electromagnetics, enabling simulation of electric, magnetic, and electromagnetic fields by solving Maxwell's equations in the quasi-static regime. It supports analyses such as electrostatics, magnetostatics, eddy currents, transient and frequency-domain studies, and is widely used to design and optimize coils/inductors, transformers, sensors, actuators, and rotating electrical machinery. The module also includes tools to extract lumped parameters (e.g., R, L, C, impedance) and evaluate electromagnetic forces/torque, and it can be seamlessly coupled with other physics (e.g., heat transfer and structural mechanics) for multiphysics workflows (e.g., induction heating and electromechanical effects).

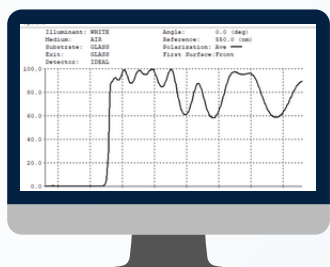
MULTIPHYSICS SIMULATION



ANSYS LUMERICAL FDTD

Multiphysics simulator specialized in photonics and nanophotonics, offering highly efficient and tailored solvers such as FDTD (FiniteDifference Time-Domain) for simulating optical devices, photonic integrated circuits (PICs), and metasurfaces. Its focus on photonic-specific workflows is complemented by dedicated libraries for dispersive and nonlinear materials, as well as seamless integration with photonic foundry PDKs for fabrication-oriented designs. Additionally, its ecosystem integrates well with system-level tools and supports co-simulation of photonic and electronic components

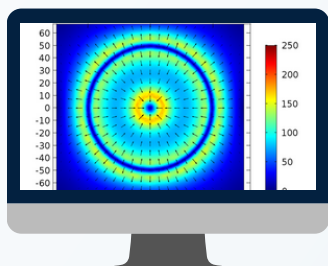
OPTICAL FILTER DESIGN



TFCALC

Industry's leading software for designing and manufacturing optical thin film coatings, supporting various materials, substrates and complex layer structures (e.g. multilayer filters, lenses). It features advanced optimization tools to refine designs for various applications.

MICROMAGNETIC SIMULATION



MUMAX3 | OOMMF

Micromagnetic simulation programs with applications, among others, in materials simulation and development. These tools solve the time and space dependent magnetization evolution in nano- to micro scale magnets using a finite-difference discretization.

OPEN ACCESS TO FACILITIES

INESC MN is a member of the NFFA, EuroNanoLab and RIANA networks, providing open-access to resources and advanced facilities to users from both Academia and Industry to carry out multidisciplinary research at the nano and microscale.



SERVICES & PARTNERSHIPS

INESC MN operates as a service provider and partner on development contracts with national and international companies. Check what we have to offer and pricing [here](#).



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